What is claimed is:

1. A fuel cell system having a fuel cell, which uses a proton conductive solid polymer electrolyte, and a secondary battery as a backup supply, comprising:

means for monitoring an output of the fuel cell and connecting a load to the secondary battery when the output thereof decreases and becomes less than or equal to a predetermined value; and

means for monitoring a remaining capacity of the secondary battery and warning that the fuel cell is running out of fuel when the remaining capacity decreases and becomes less than or equal to a predetermined value.

2. The fuel cell system according to claim 1, further comprising:

means for detecting a decrease in the output of the fuel cell; and

means for indicating a warning signal showing that the fuel cell is running out of fuel, when the load has been connected to the secondary battery.

3. The fuel cell system according to either one of claims 1 and 2, wherein the fuel cell is a direct fuel cell the cell being one to which a liquid fuel is directly supplied, and the liquid fuel is supplied from a fuel cassette which is detachably attachable.

4. A method for detecting running out of fuel in a fuel cell system having a fuel cell, which uses a proton conductive solid polymer electrolyte, and a secondary battery as a backup supply, comprising the steps of:

monitoring an output of the fuel cell without using a fuel sensor and connecting a load to the secondary battery when the output thereof decreases and becomes less than or equal to a predetermined value; and

warning that the fuel cell is running out of fuel, when the remaining capacity of the second battery decreases and becomes less than or equal to a predetermined value.